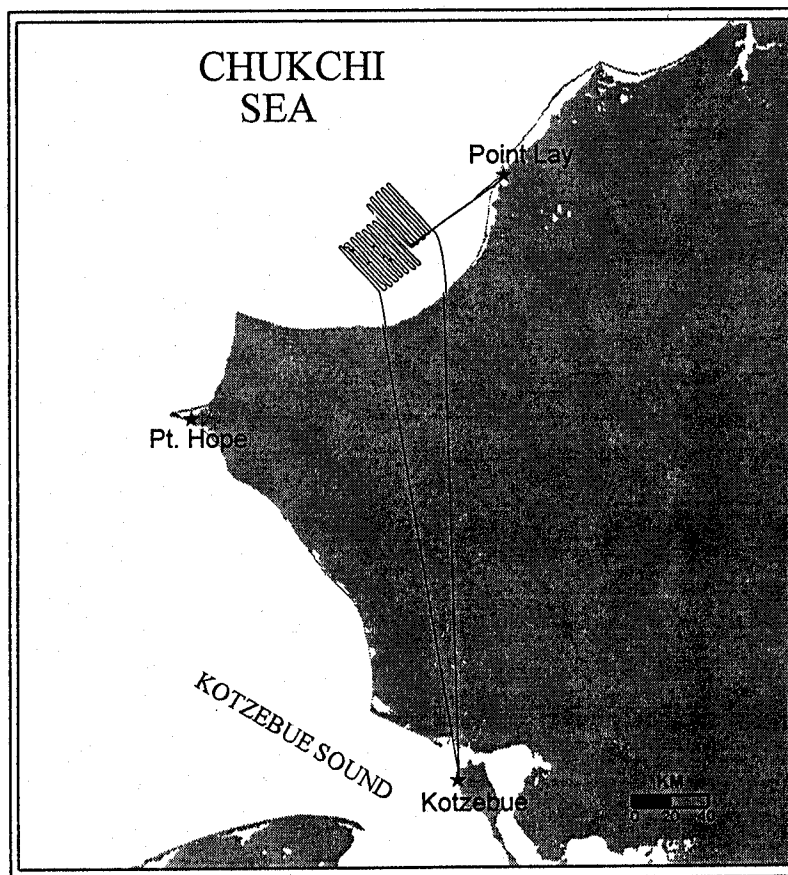


**DISTRIBUTION AND ABUNDANCE OF
SPECTACLED EIDERS (*Somateria fischeri*)
IN LEDYARD BAY, ALASKA
SEPTEMBER 1995**

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Abstract.

Analysis of two years of satellite telemetry data revealed a location in Ledyard Bay southwest of Point Lay, Alaska, as a possible molting/post-breeding staging area for spectacled eiders (*Somateria fischeri*). To verify and evaluate the use of the area we conducted two contiguous-grid aerial surveys in late September, 1995. Choppy seas during the first survey on 20 September made birds less visible from the air, resulting in a low estimate of 7598 eiders. A calm water surface and good lighting on 21 September resulted in ideal survey conditions, and we estimated 33,192 eiders. Telemetry data and physical location of the area suggest that most of the birds in Ledyard Bay are associated with the Alaskan arctic coastal plain spectacled eider breeding area. A few male eiders breeding in the Indigirka Delta and the Yukon-Kuskokwim Delta also molt in this area, according to satellite telemetry data. Concentric distributions of spectacled eiders in Ledyard Bay determined by telemetry and aerial surveys suggest that the species has a strong traditional preference for a specific location there, a behavior that has been documented elsewhere for the species. No other species of *anatidae* were observed within the survey area.

Key Words: Waterfowl, spectacled, eider, *Somateria fischeri*, satellite, telemetry, aerial, Chukchi Sea, Ledyard Bay, Alaska

INTRODUCTION

We have used a combination of satellite telemetry and aerial surveys to identify and describe pelagic aggregations and habitats of spectacled eiders (*Somateria fischeri*) in Alaskan waters in Norton Sound, the polynya south of St. Lawrence Island, and an area northeast of St. Matthew Island, as well as in Mechigmenskiya Bay on the eastern coast of Chukotka, Russia (Petersen et al. 1995a,b, Larned and McCaffery 1993, Larned et al. 1995a,b). A male eider implanted with a satellite transmitter on the Yukon-Kuskokwim Delta in early June 1994 turned up in Ledyard Bay, Alaska, in late June, presumably to molt. Investigating the possibility of a molting concentration there, Karen Laing and Robert Platte (Larned et al. 1995a) flew a series of widely-spaced aerial transects in Ledyard Bay on 18 August 1994, observing 101 spectacled eiders. Satellite transmitters were deployed again in 1995, including 10 implanted into breeding females in the Prudhoe Bay vicinity. By 14 September, 8 of these were located offshore in Ledyard Bay. We used ARGOS data to monitor the movements of these marked birds as they arrived, and conducted an intensive aerial grid survey there on 20 and 21 September. This brief report presents the results of that effort.

OBJECTIVES

Objectives of the survey in descending order of priority were:

1. Describe the size, distribution, and behavior of the population of spectacled eiders occupying Ledyard Bay in late September.
2. Describe the populations of other waterbirds and marine mammals in the survey area.

METHODS

We conducted a simple grid search of the area where transmitter-implanted birds were concentrated, as indicated by ARGOS satellite data. We plotted the latest ARGOS location coordinates on Sectional aviation charts, and laid out a grid of 24 parallel lines 34 km long and 1.9 km apart around the array of plotted points. We flew this grid on 20 September. Using the eider distribution observed on 20 September as a guide, we drew a new grid, with 23 lines 35 km in length and 1.4 km apart, which we flew on 21 September. We made several adaptive adjustments to the grid line endpoints as we went along, based on the observed distribution of birds (Fig. 1). The overall grid dimensions were limited by our daily fuel endurance, which we extended by carrying 60 gallons in the baggage compartment in 15-gallon containers, transferring it during a brief rest stop at Point Lay.

The survey crew consisted of pilot Douglas Burts, forward right observer Bill Larned, and left rear observer Greg Balogh. We used a chartered Aero-Commander Model AC-500 Shrike twin-engine aircraft which we flew at 185-220 km/hr (100-120 kts) and 92-154 m (300-500 ft) altitude. We observed and estimated flocks to a maximum of one-half the distance to the next transect, for total coverage of the surveyed area.

Our primary navigation instrument was an ARNAV Star 5000 GPS with a grid-plotting feature which automated generating and navigating a search grid. We recorded the flight path using a GPS data-logging program called GPSTRAK8, developed by Robert Stehn and Michael Anthony (National Biological Service, 1011 East Tudor Road, Anchorage, AK 99503). The output file contained position coordinates logged at 4-second intervals, and the current time for each position from the computer clock. Coordinates for each visual observation were obtained indirectly by recording the exact time of the observation, from a watch synchronized with the computer clock, into audio tapes. The observations were entered into the track file by matching corresponding times. We then mapped flight paths and locations of observations using Atlas GIS software.

We initially intended to photograph all flocks and count birds in photographs as we did in April 1995 in the Bering Sea (Larned et al. 1995b), but the large number of flocks and scattered distribution of birds within flocks made this alternative impractical. However, after completing the survey grid on 21 September we photographed a few large flocks of spectacled eiders to determine sex ratios. We used a 35 mm camera with motor drive and 28-105 mm variable focal length lens, with 200 and 400 ISO color slide film. All photographs were taken obliquely through an open window by the forward right observer. To obtain estimates of sex ratios of birds from photographs, we projected the color transparencies onto 27 inch X 34 inch white paper ("flip charts") using a standard slide projector. We drew a grid of parallel lines on the paper through each projected flock, and counted birds of each sex between the lines using a hand tally counter.

Flight time for the survey included 6.25 hrs. round trip from Anchorage to our staging point in Kotzebue, 7.5 hrs. for the 20 September survey and 6.8 hrs. for the 21 September survey.

RESULTS AND CONCLUSIONS

Surface visibility reduced by choppy seas and abundant whitecaps diminished our ability to detect birds on 20 September. Flocks of spectacled eiders were small, widely scattered, and the birds in most were dispersed loosely, making them hard to spot. While we could readily see flocks near our transect centerline, flocks beyond approximately 400 meters were rarely observed unless they were in flight. Other species were equally difficult to observe. On 21 September, however, very calm surface conditions made it possible for us to observe birds and marine mammals easily, well beyond the intended strip width. The effect of this visibility disparity may be seen by comparing estimates of most species between days (Tables 1 and 2).

Population estimates

The estimate of 33,192 spectacled eiders made on 21 September was made by adding visual estimates of 222 groups of birds ranging from 1-2000 individuals. The estimates are subject to the various biases normally associated with aerial flock estimates by trained and experienced observers. Because of the excellent sea conditions, very few flocks were missed, and flocks appeared to move little during the survey, so double counting was not a significant problem. The estimate should be considered minimal, because there were several widely-scattered flocks in the northern portion of the survey area, suggesting that there were more flocks farther north. However, we believe the number of uncounted